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Environmental Hotspot Alert

Athabasca Oil Sands, Require Massive Investments and Energy and Produce Massive Amounts of Oil—and CO₂ Alberta, Canada

Alberta's active oil-sands operations have seen dramatic growth over the past 20 years and now span over 55 km from north-to-south; they burn about 22.5 million m³ of natural gas a day and emit over 8 000 tonnes of CO₂ per year

Did You Know ?

After heavy rains during recent weeks, flood waters inundate the state of Queensland, Australia, covering an area larger than France and Germany combined (UN News Centre 2011).



Environmental Hotspot Alert

Thematic Focus: Resource Efficiency, Ecosystem Management, and Climate Change

Athabasca Oil Sands, Require Massive Investments and Energy and Produce Massive Amounts of Oil—and CO₂ Alberta, Canada

Why is this issue important?

The Athabasca Oil Sands region of Alberta, Canada forms the second-largest deposit of recoverable oil

in the world after Saudi Arabia (Whitfield and others 2010). The energy and environmental costs of extracting oil from oil sands have made their development very controversial.

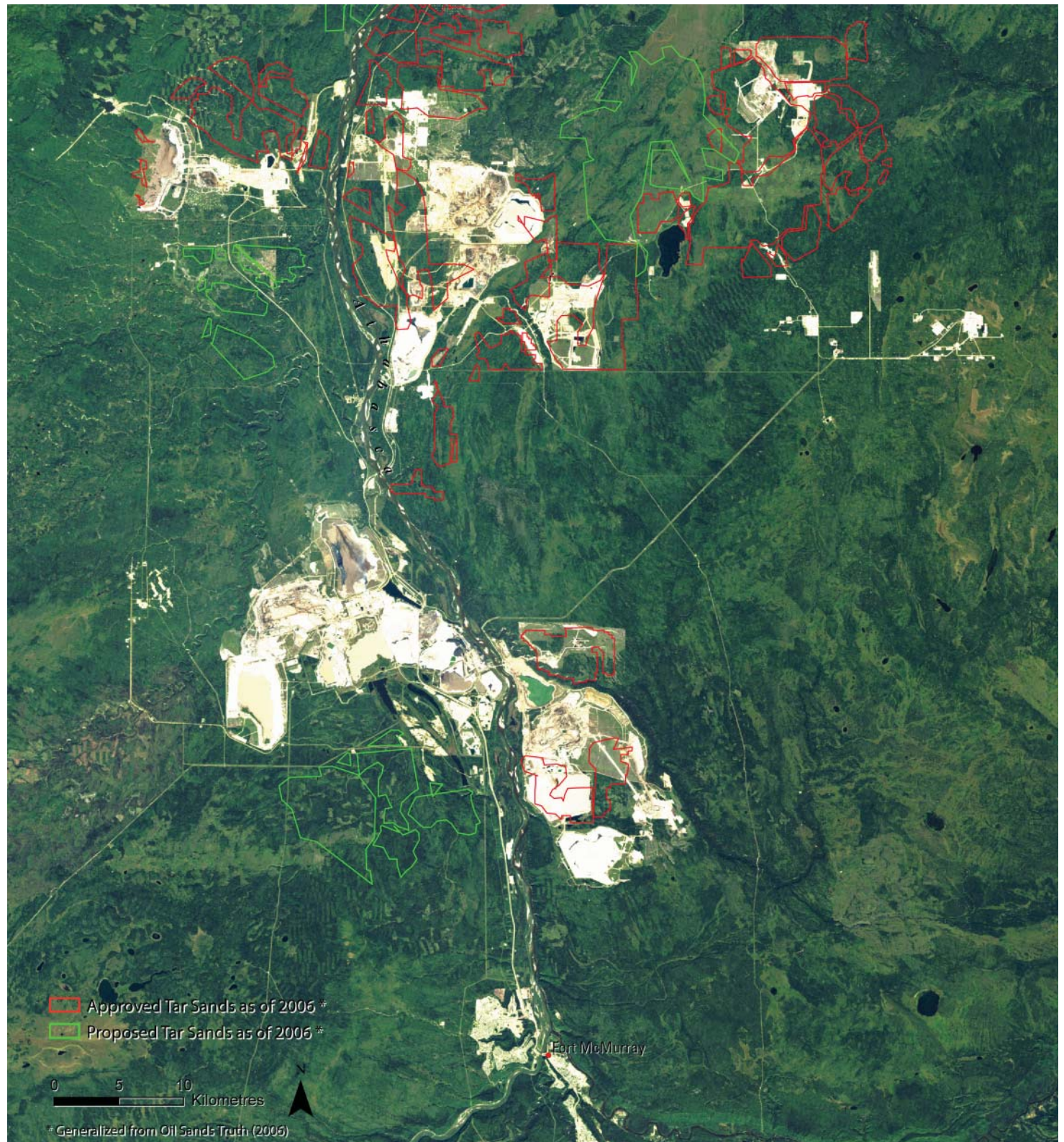
Figure 1: A Landsat satellite image from 1989 shows the light colored mines and tailings ponds amid the wetlands and forests in the Athabasca area.



The oil sands industry burns about 22.5 million m³ of natural gas daily to extract bitumen (Tenenbaum 2009). This burning is the main source of the over 8 000 tonnes of CO₂ per year emitted by the oil sands industry and accounts for much of Canada's growing CO₂ emissions (Humphries 2008). In addition, the oil sands mines release a significant amount of SO₂ and other atmospheric pollutants (Williams 2010). Water is used in oil sands extraction to help separate the bitumen from the oil sands. The industry already diverts around 150 million m³ of water from the Athabasca River and



Figure 2: In this 2010 satellite image the mining areas have grown dramatically. The red and green polygons show the areas proposed and approved for mining in 2006 – many of these areas have already been exploited by the time the 2010 image was acquired.



the Canadian government has approved diversions of more than twice that volume, raising concerns about inadequate flow (Humphries 2008). Waste-water disposal from the production process goes into large tailing ponds and poses a threat to groundwater and surface water quality, wildlife and soils if leakage occurs (Humphries 2008).

While commercial production began around Fort McMurray, Alberta in 1967, the cost of recovering the bitumen from the oil-sands deposits was expensive and the oil was of low quality (Williams 2010). Bitumen is very heavy, low-quality oil, which is too viscous to pump from the ground. It makes up only 3 to 18 per cent of the oil sands formations, which must be strip-mined (Williams 2010). The bitumen is then extracted using hot water and further refined to make conventional petroleum products. As prices for crude oil rise, more of the roughly 140 000 km² of oil-sands deposits become cost effective to mine. Oil sands production was approaching half of all Canadian oil production in 2008 (Humphries 2008). Ninety-nine per cent of Canada's oil exports go to the United States.

In September of 2010 Canada's Environment Minister appointed a panel of leading scientists chaired by former UNEP executive director Liz Dowdeswell. They were asked to evaluate the state of environmental monitoring in the Athabasca region. Their report found that while there were many monitoring programs and considerable academic research that there was "no evidence of science leadership to ensure that monitoring and research activities" were coordinated and integrated (EC 2010).

What are the findings and implications?

Rising oil prices and increasing interest in finding energy sources closer to home for the world's largest oil consumer, the United States, have led to enormous

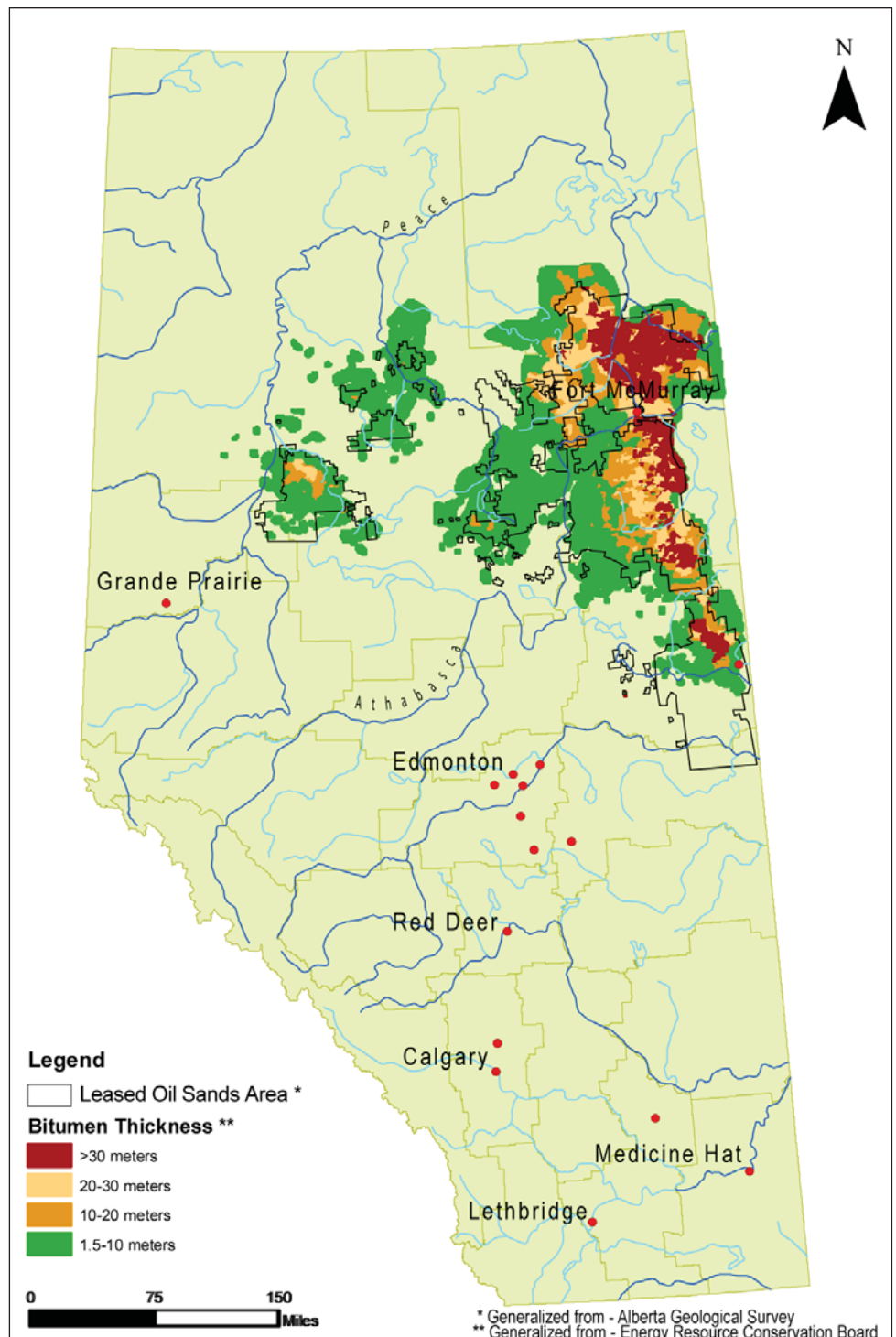


Figure 3: The area and thickness of bitumen deposits lying under the Canadian boreal forest are overlain with the leases granted to several international oil developers. Leases already cover most of the viable deposits.

investments in the Athabasca Oil Sands—an estimated US\$40 billion in 2010 alone (CAPP n.d., Humphries 2008). The 1989 satellite image (Figure 1) shows the footprint of oil sands mining in the Fort McMurray area just as the Canadian Government was beginning to encourage the industry's expansion. The bright areas cut into the boreal forest and muskeg wetlands are mining pits, tailings ponds, production facilities and roads. The 2009 image (Figure 2) shows the dramatic growth in active operations spanning over 55 km from north-to-south.

References provided on page 5

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